ORDER NO. AD9703031C8

Service Manual

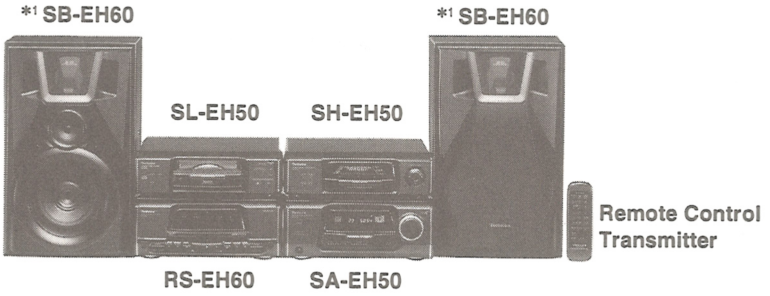
Sound Processor

SH-EH50

System: SC-EH50

Sound Processor

For (E) / (EP) areas



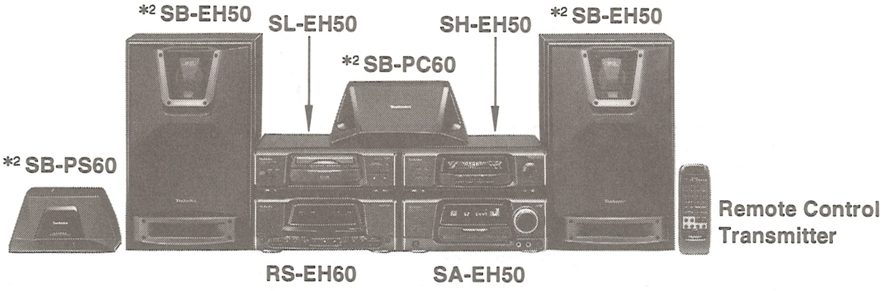
Colour

(K) ...... Black

Area

(E)/(EP) ... Europe, Russia.
(GC) .... Asia, Latin America, Middle East and Africa.

For (GC) area



[For (GC) area only]

DOLBY SURROUND
PRO • LOGIC

Because of unique interconnecting cables, when a component requires service, send or bring in the entire system.

Specifications

EQ/SFP Section

MANUAL GEQ :

Center frequency ; 100 Hz, 315 Hz, 1 kHz, 3.15 kHz, 10 kHz
Level control ; ± 3, 6, 9 dB

EQ SPACE mode (3 modes) : HALL, CLEAR, HEAVY
Acoustic Image Selector : 36 pattern

DOLBY PRO LOGIC Section [For (GC) area only]

PRO LOGIC mode : SURROUND, 3 STEREO
CENTER mode : NORMAL, WIDE, PHANTOM
DELAY TIME : 20 ms (Fixed)

Spectrum analizer Section

Display mode : NORMAL, PEAKHOLD, AURORA

General

Dimensions : 287 (W)/89 (H)/273.5 (D) mm
Weight : 1.1 kg

Note: Specifications are subject to change without notice.
Weight and dimensions are approximate.

System/SC-EH50:

For (E)/(EP) area
Sound processor: SH-EH50, Tuner/Amplifier: SA-EH50, Compact disc player: SL-EH50, Cassette deck: RS-EH60,
Front speakers: *1 SB-EH60

For (GC) area
Sound processor: SH-EH50, Tuner/Amplifier: SA-EH50, Compact disc player: SL-EH50, Cassette deck: RS-EH60,
Front speakers: *2 SB-EH50, Center speaker: *2 SB-PC60, Surround speakers: *2 SB-PS60

Notes: ✻1 ...Made in PAES
✻2 ...Made in MESA

⚠WARNING

This service information is designed for experienced repair technicians only and is not designed for use by the general public. It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product.
Products powered by electricity should be serviced or repaired only by experienced professional technicians. Any attempt to service or repair the product or products dealt with in this service information by anyone else could result in serious injury or death.

Technics®

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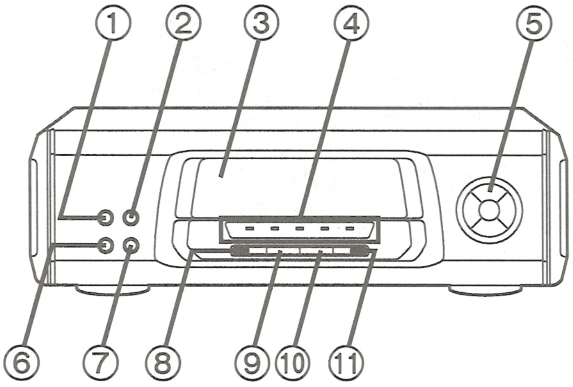
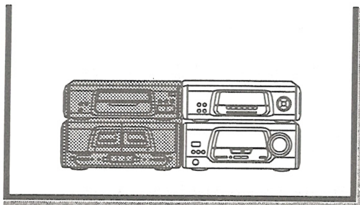
NOTE:
Refer to the service manual for Model No. SA-EH50 (ORDER No. AD9703053C8) for information on "Accessories", "Connections", "Installation" and "Packaging".

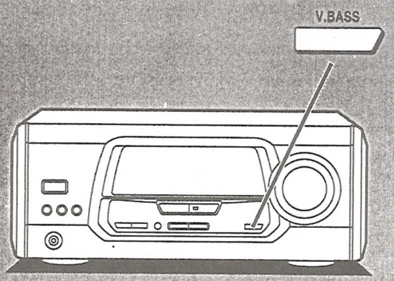
■ Location of Controls

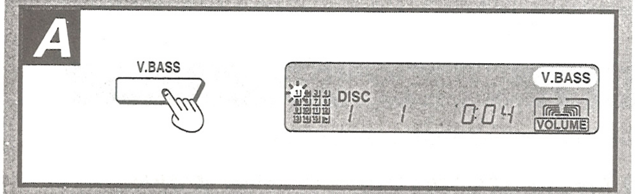


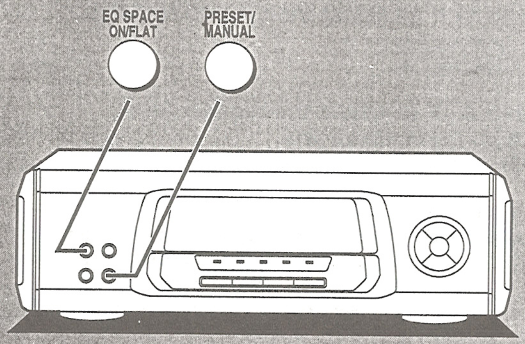
① EQ SPACE on/flat button (EQ SPACE ON/FLAT)
② Display mode select/demonstration button (DISP MODE/-DEMO)
③ Display
④ DOLBY PRO LOGIC indicators (SURROUND, 3 STEREO, NORMAL, WIDE, PHANTOM) (GC) area only
⑤ Multi control buttons (MULTI CONTROL, ▶ , ▲ , ◀ , ▼)
⑥ Acoustic image EQ button (ACOUSTIC IMAGE EQ)
⑦ EQ SPACE preset/manual select button (PRESET/MANUAL)
⑧ DOLBY PRO LOGIC on/off button (DOLBY PRO LOGIC, OFF/ON) (GC) area only
⑨ DOLBY PRO LOGIC mode select button (MODE) (GC) area only
⑩ DOLBY PRO LOGIC test signal button (TEST) (GC) area only
⑪ DOLBY PRO LOGIC center mode button (CENTER MODE) (GC) area only

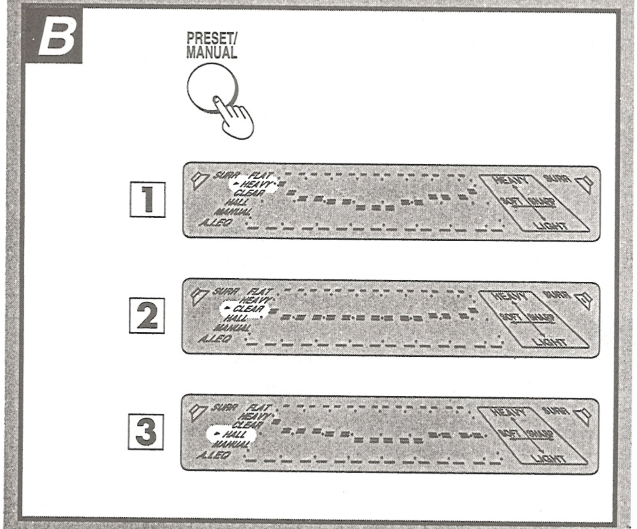
■ Changing the Tone






A
V.BASS
DISC
1
1
0:04
V.BASS
VOLUME


EQ SPACE ON/FLAT
PRESET/ MANUAL


B
PRESET/ MANUAL
1
2
3
SURR
FLAT
HEAVY
CLEAR
HALL
MANUAL
A.LEQ
HEAVY
SURR
SOFT
SHARP
LIGHT

To listen with augmented bass (V. BASS)

A

Press V. BASS.

To cancel, press V. BASS once again.

Note

You cannot record with the V. BASS effect.

"V. BASS" is only effective on sounds which can be heard through the speakers or headphones.

Using the internal sound quality

B

Press PRESET/MANUAL to select the desired mode.

Each time you press PRESET/MANUAL, EQ and SPACE modes will be switched as follows.

HEAVY→CLEAR→HALL→MANUAL
↑______________________________|

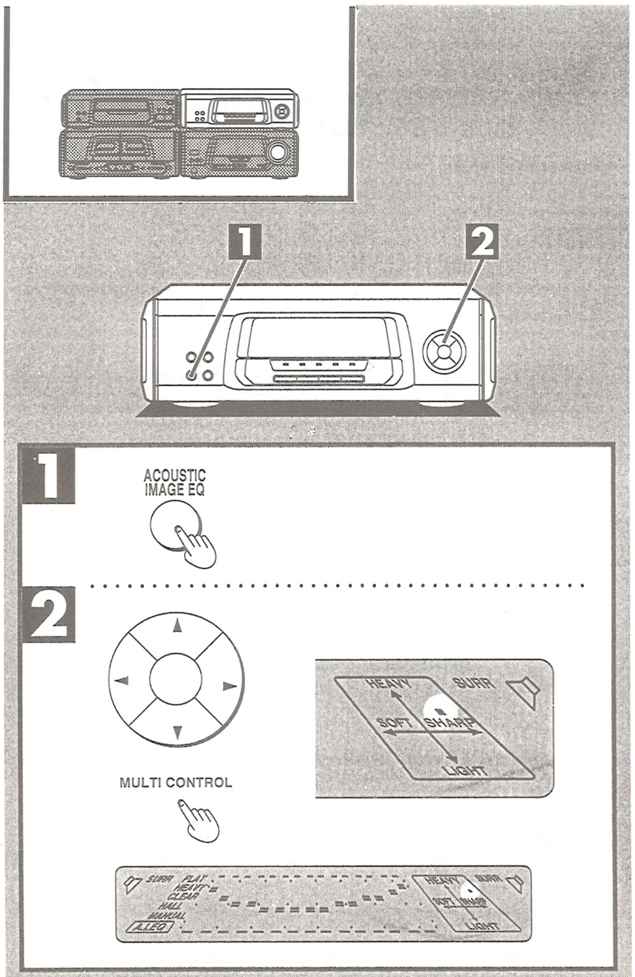
1 **HEAVY:**	Use to add "punch" to rock and other music.
2 **CLEAR:**	Use to clarify the treble range of jazz, etc.
3 **HALL:**	Use to impart a deep bass and spread which will make you feel as if you were in a large concert hall.
4 **MANUAL:**	Refer to the "Finer sound quality changes" section on Page 4.

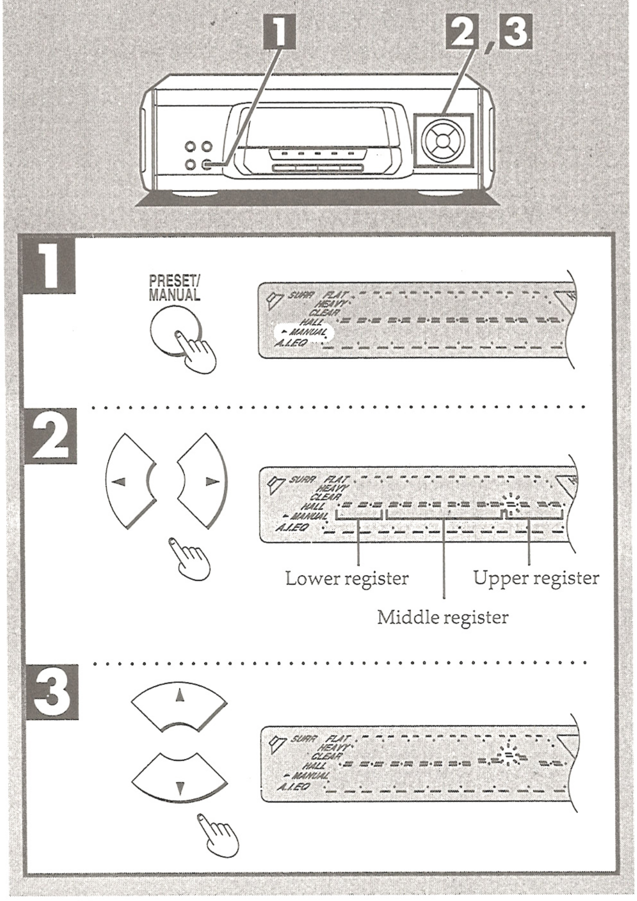
To cancel the EQ SPACE effect

Press EQ SPACE ON/FLAT to select "FLAT".

Notes

- Recordings cannot be made in the HALL, CLEAR, HEAVY or MANUAL modes.
- Recording during use of sound quality operation will cause the "HALL", "CLEAR", "HEAVY" and "MANUAL" indicators to disappear and light again when recording is completed.





Lower register

Upper register

Middle register

Using the acoustic image EQ

This function allows easy creation of sounds closer to what you imagine.
The figure shows an example where the sound quality has been adjusted to HEAVY level 2 and SHARP level 3.

1 Press ACOUSTIC IMAGE EQ.

2 Press the ▲ ▼ ◀ ▶ buttons to move the cursor to the desired music image.

HEAVY (▲):	When a heavier sound is desired
LIGHT (▼):	When a lighter sound is desired
SOFT (◀):	When a softer sound is desired
SHARP (▶):	When a sharper sound is desired

To cancel the ACOUSTIC IMAGE EQ effect
Press EQ SPACE ON/FLAT to select "FLAT".

Notes

- Sounds can be made to fit a total of 36 images.
- The resulting adjustment is automatically stored in memory. When the ACOUSTIC IMAGE EQ is pressed again, the image last selected is automatically selected.

Finer sound quality changes

Finer sounds can be created by selecting MANUAL.

1 Press PRESET/MANUAL to select MANUAL.

2 Press ◀ ▶ to select the desired register.

◀: Upper register
▶: Lower register

3 Press ▲ ▼ to adjust the register level.

▲: Increasing the register level
▼: Decreasing the register level

For your reference:

Upper register: includes pipes, strings, cymbals and triangles

- Increasing the upper register: mellows pipes and strings, adds precision and glitter
- Decreasing the upper register: quiets music, rids music of its "stretch"

Middle register: vocals (voice)

- Increasing the middle register: gives strength and punch to music brings voices forward, brightens sound
- Decreasing the middle register: quiets music, pulls voices back, softens intense sounds

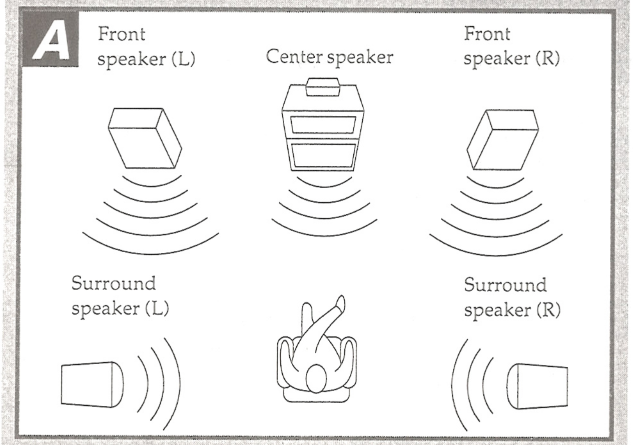
Lower register: includes bass and drums

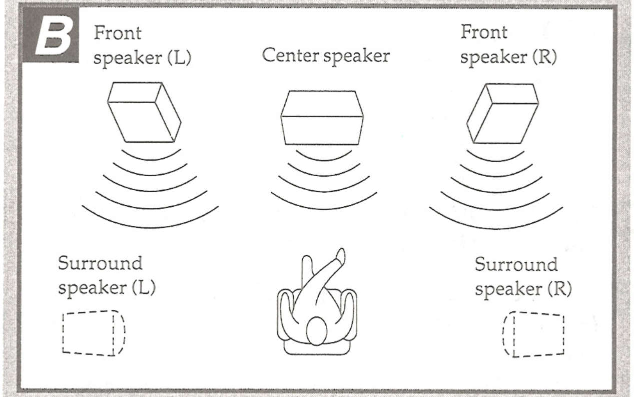
- Increasing the lower register: stabilizes heavy and low sounds, swells low sounds
- Decreasing the lower register: decreases noise in lower sounds, reduces muffled sounds

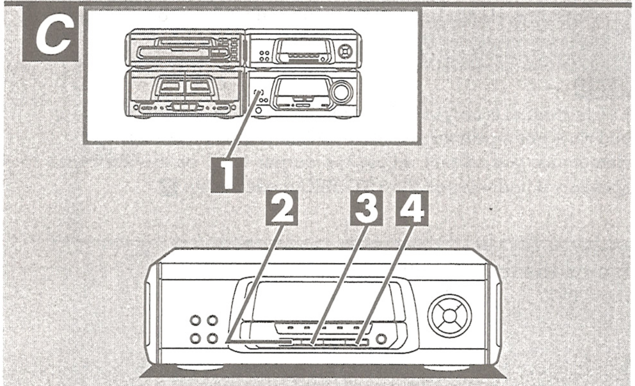
Notes

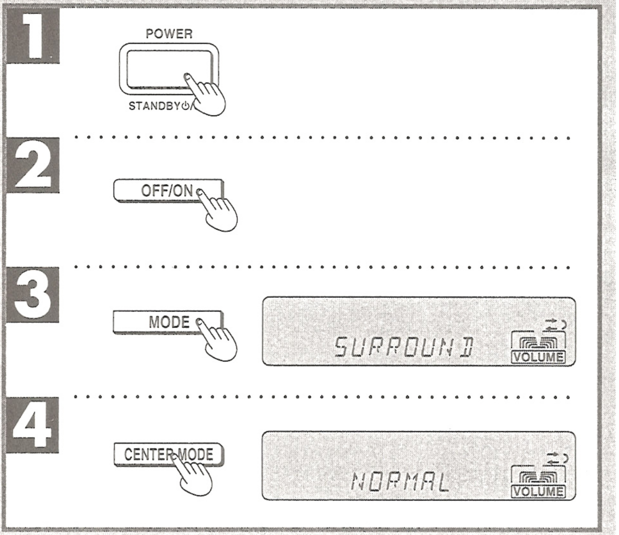
- The resulting adjustment is automatically stored in memory. When the MANUAL mode is selected again, the sound quality last selected is automatically played back.
- The register can be manually adjusted at 5 individual points along the 100 Hz~10 kHz frequency range.

Enjoying Sound with DOLBY PRO LOGIC [For (GC) area only]


A
Front speaker (L)
Center speaker
Front speaker (R)
Surround speaker (L)
Surround speaker (R)


B
Front speaker (L)
Center speaker
Front speaker (R)
Surround speaker (L)
Surround speaker (R)




1
POWER
STANDBY
2
OFF/ON
3
MODE
SURROUND
VOLUME
4
CENTER MODE
NORMAL
VOLUME

By combining front, center and surround speakers, you can enjoy the SURROUND mode which conveys a feeling of presence or the 3 STEREO mode which conveys a feeling of orientation.

SURROUND

A

By reproducing the feeling of depth and movement of sound, video software or compact discs recorded with Dolby Surround provide the listener with the sensations of a movie theater.

To enjoy SURROUND, be sure to connect the surround speakers.

3 STEREO

B

You can enjoy audio/video sources with clear sound, more presence and enhanced orientation. 3 STEREO can be used with sources not recorded in DOLBY SURROUND.
To enjoy 3 STEREO, be sure to connect the center speaker.

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DOLBY, the double-D symbol DD and "PRO LOGIC" are trademarks of Dolby Laboratories Licensing Corporation.

Setting the center mode

C

For Dolby Pro Logic systems, center mode setting is necessary to play back bass sounds effectively. Set the center mode in accordance with the size of your center speaker.

1 Switch on the power.

2 Press DOLBY PRO LOGIC OFF/ON to select ON.

3 Press MODE to select "SURROUND" or "3 STEREO".

Each time you press the button, the display will change as follows:
SURROUND→3 STEREO
↑

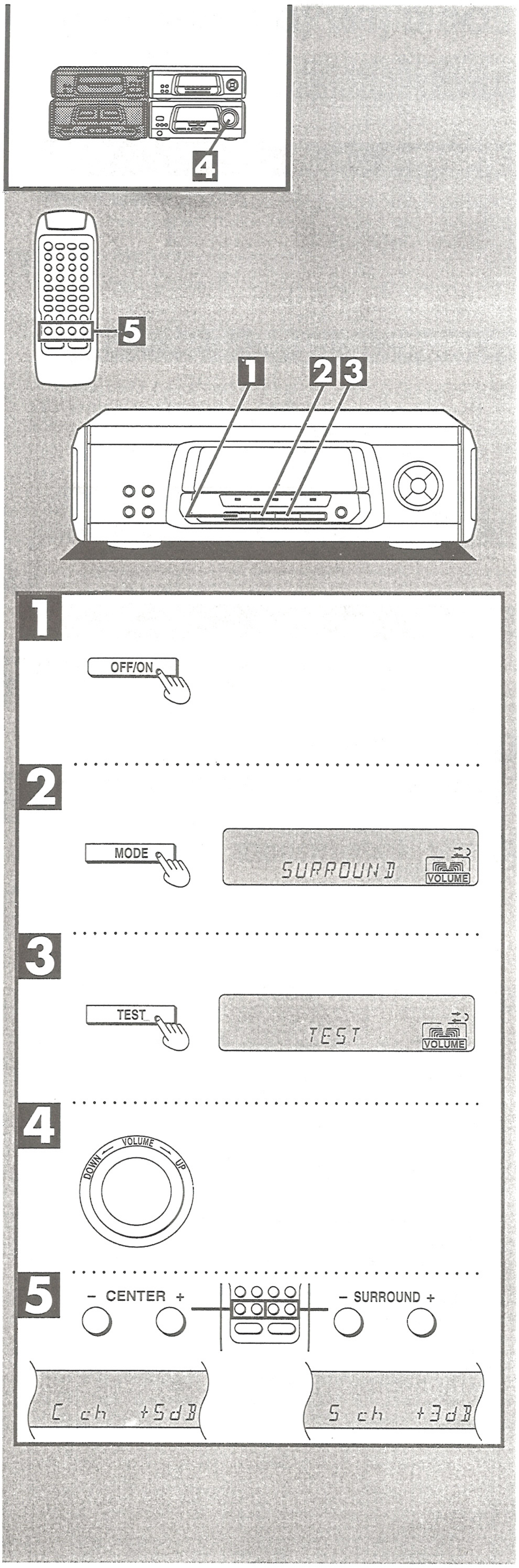
4 Press CENTER MODE to select "NORMAL" mode.

Each time you press the button, the display will change as follows:
NORMAL→WIDE→PHANTOM
↑

Note
"PHANTOM" will not be displayed when you select "3 STEREO" in step 3.

NORMAL:
When the center speaker is smaller than the front speakers
WIDE:
When the center speaker is the same size or larger than the front speakers
PHANTOM: **SURROUND only**
When no center speaker is connected

Note
In the PHANTOM mode, the sound which would have been sent to the center speaker will be divided equally between both the left and right front speakers.



Adjusting speaker output level

In order to reproduce the movement of the sound and its clear orientation, it is important to adjust the output level of each speaker. Adjust output to the correct levels while listening to the test signal.

1 Press DOLBY PRO LOGIC OFF/ON to select ON.

2 Press MODE to select "SURROUND" or "3 STEREO".

Each time you press the button, the display will change as follows:

SURROUND→3 STEREO
↑_______________|

3 Press TEST to output a test signal.

The test signal is emitted in the following order:

For SURROUND mode

Front speaker (left)——————→Center speaker
↑ ↓
Surround speakers (left, right)←—Front speaker (right)

Note

The test signal is not emitted from the center speaker when the center mode is on PHANTOM.

For 3 STEREO mode

Front speaker (left)→Center speaker→Front speaker (right)
↑_______________________________________|

4 Turn VOLUME to set the volume level normally used for enjoying the source.

5 Press CENTER (–) or (+) or SURROUND (–) or (+) on the remote control to adjust the output level balance.

Adjust the output level of each speaker from the listening position until they are all identical.

Output levels can be varied within a range of ±12 dB with front speaker output level serving as the zero point.

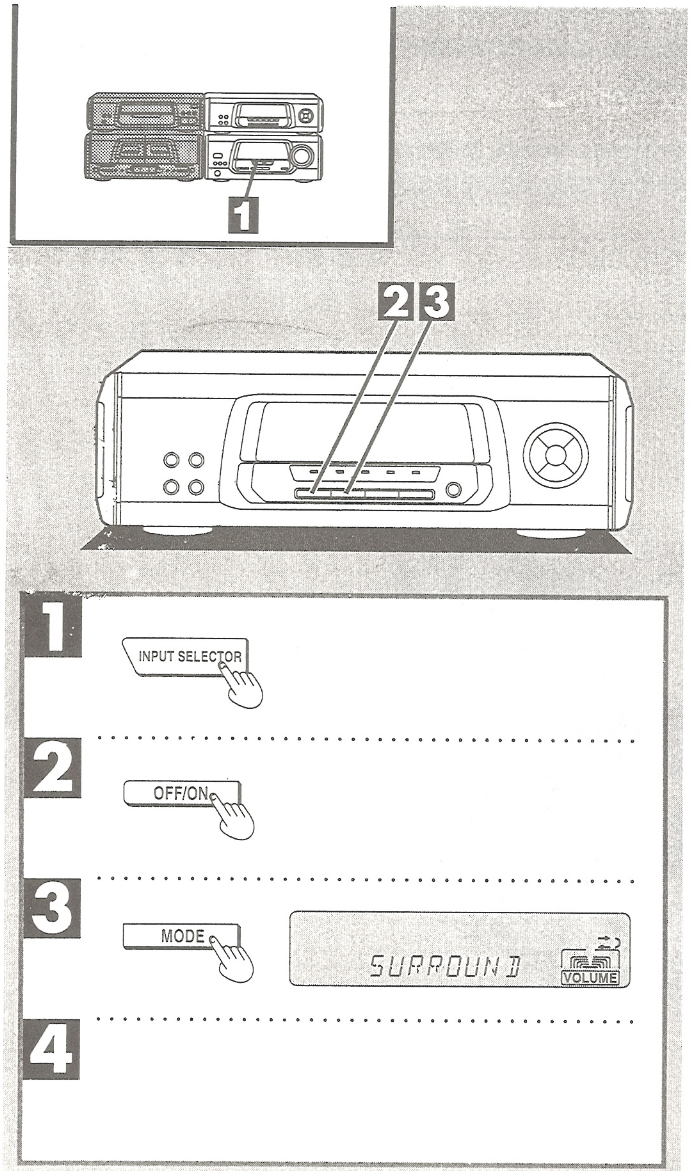
Notes

- The test signal is output only by the speaker you are now adjusting and does not repeat the sequence until adjustments are complete.
- Remember you cannot adjust the output level of the surround speakers if you selected the 3 STEREO mode in step 2

To stop the test signal:

Press TEST.

■ Enjoying with SURROUND or 3 STEREO [For (GC) area only]



Enjoying with SURROUND or 3 STEREO

Before trying anything, have you set the center mode and adjusted speaker output level?
When viewing a video, turn on the power supply for the TV and set the TV to video mode.

1 Press INPUT SELECTOR to select the desired external source.

Each time you press this button, sound sources will be switched as follows.

TUNER → CD → TAPE
↑ ↓
VDP(AUX) ← VCR(EXT)

These indications correspond to terminals on the rear panel of the sound processor or tuner/amplifier. Switch the displayed indication to the source you want to use.

2 Press DOLBY PRO LOGIC OFF/ON to select ON.

3 Press MODE to select "SURROUND" or "3 STEREO".

4 Start the desired source.

To operate external sources, refer to the operating instructions provided with the specific unit.

Note

When using SURROUND, use software recorded in Dolby Surround.

To turn off the DOLBY PRO LOGIC systems:

Press DOLBY PRO LOGIC OFF/ON to select "OFF".

Note

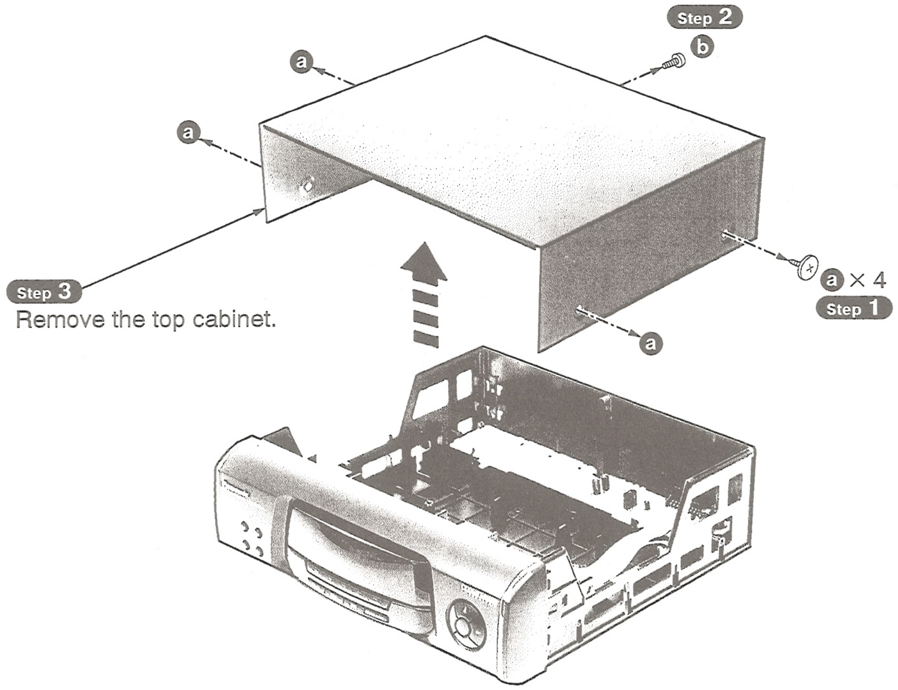
You cannot record acoustical effects produced in the SURROUND and 3 STEREO modes.

Operation Checks and Main Component Replacement Procedures

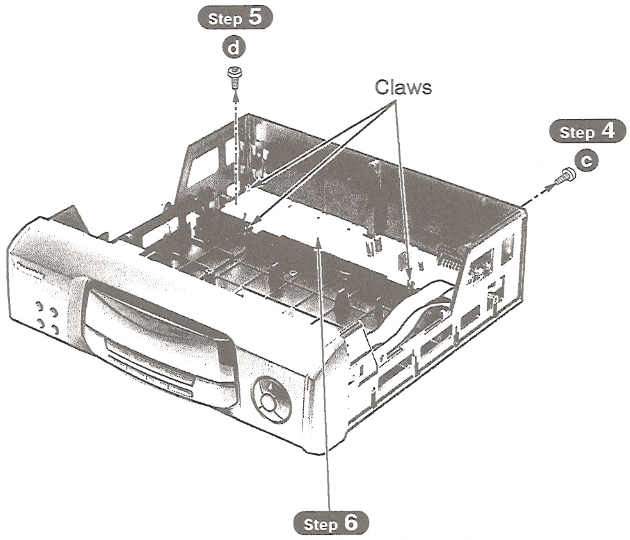
NOTE

1. **This section describes procedures for checking the operation of the major printed circuit boards and replacing the main components.**
2. **For reassembly after operation checks or replacement, reverse the respective procedures. Special reassembly procedures are described only when required.**

1. Checking for the IN/OUT terminal P.C.B.


Step 2
b
a
a
a × 4
Step 1
a

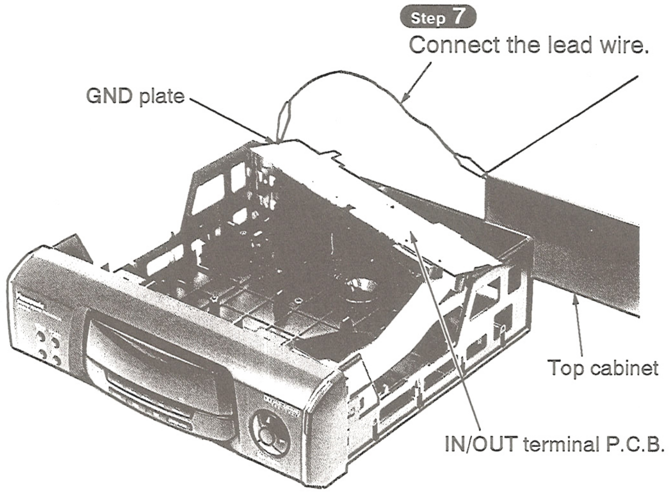
Step 3
Remove the top cabinet.


Step 5
d
Claws
Step 4
c

Step 6
Release the 3 claws, and then remove the IN/OUT terminal P.C.B..

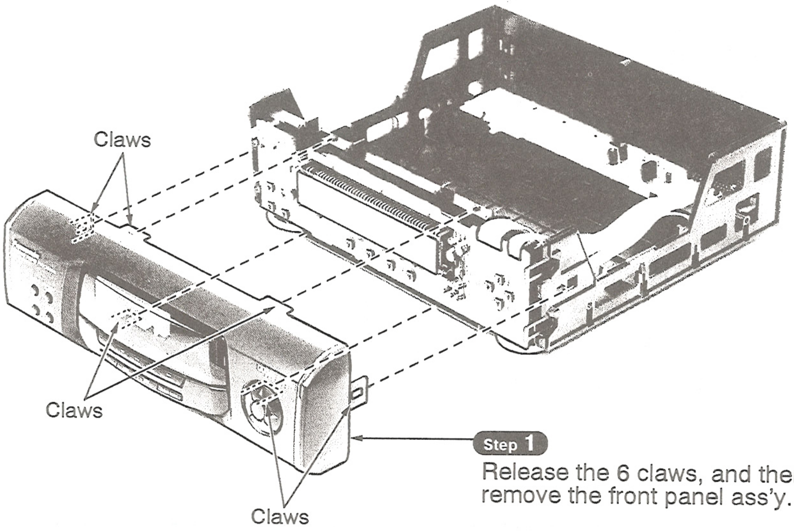
• Check the IN/OUT terminal P.C.B. as shown below.

Step 7
Connect the lead wire.


GND plate
Top cabinet
IN/OUT terminal P.C.B.

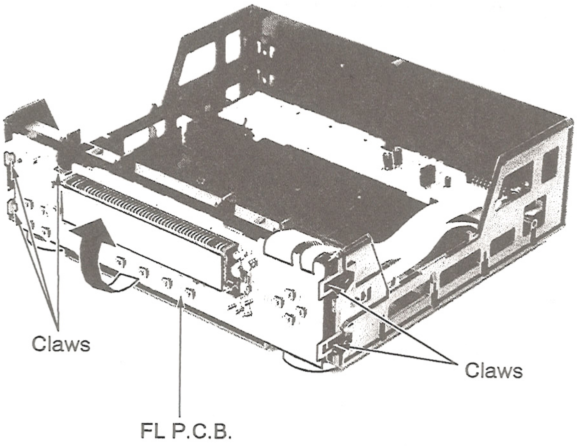
2. Checking for the FL P.C.B.

- Follow the Step 1 ~ Step 3 of the item 1 in checking procedure for each P.C.B. on page 8.

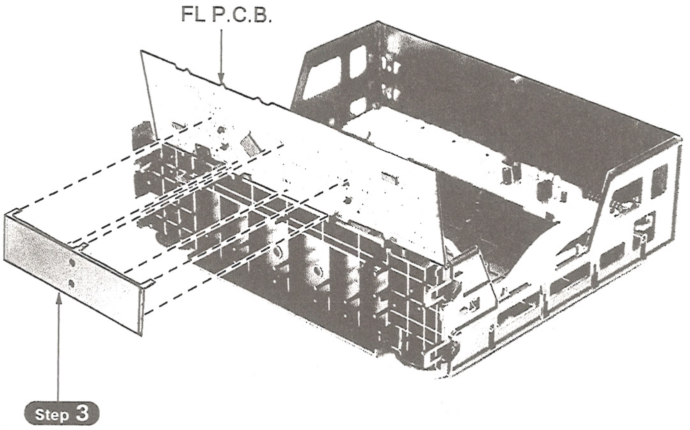

Claws
Claws
Claws

Step 1
Release the 6 claws, and then remove the front panel ass'y.

Step 2
Release the 5 claws, and then remove the FL P.C.B..


Claws
Claws
FL P.C.B.

- **Check the FL P.C.B. as shown below.**



Step 3
Unsolder the shield plate terminals.
(6 points)

■ To Supply Power Source

This unit SH-EH50 is designed to operate on power supplied from the Tuner/Amplifier SA-EH50. When operating the unit SH-EH50 alone for testing and servicing, without having power supplied from the Tuner/Amplifier SA-EH50, use the following method.

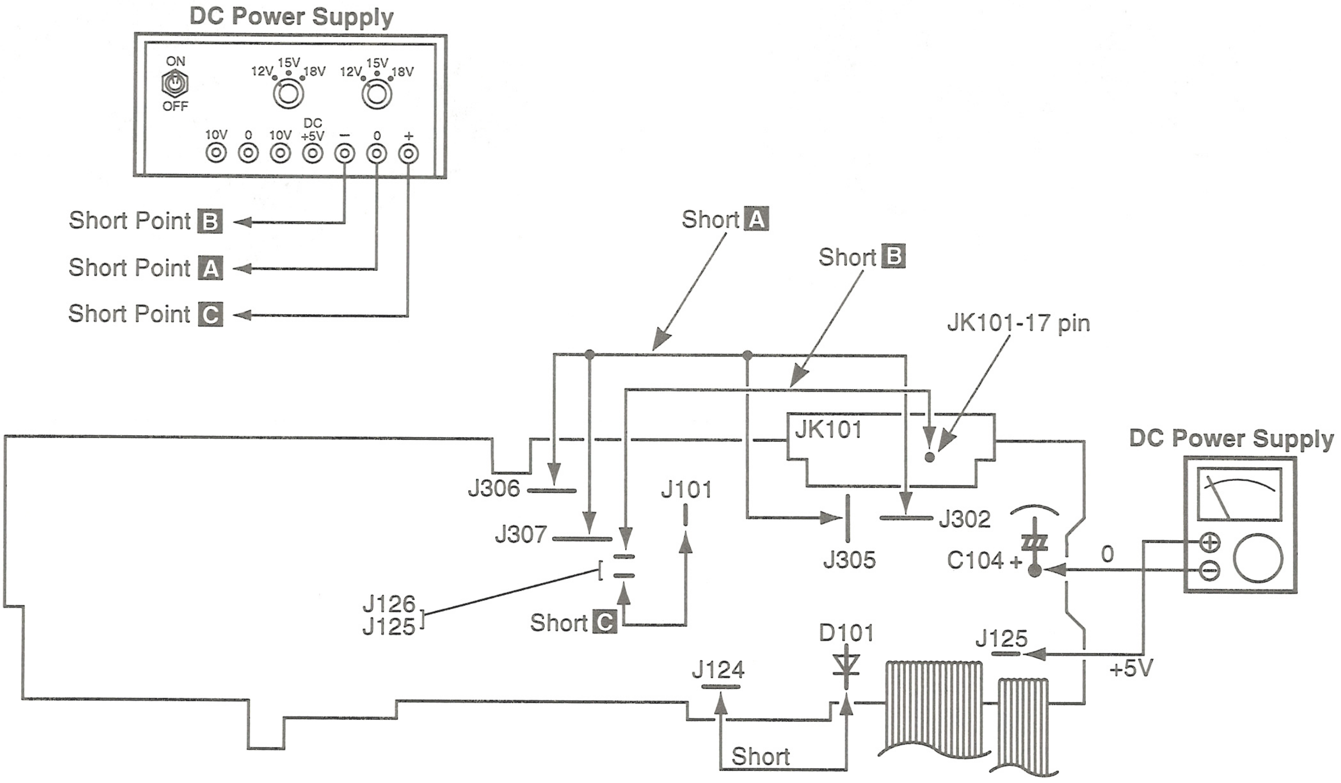
Power Supply to Video Selector Circuit

1. Short the section between **J124** and **R753**.
2. Short the section **J306, J307, J305** and **J302** with each other. (Point A)
3. Short the section between **J126** and **17 pin** of the connector **JK101**. (Point B)
4. Short the section between **J125** and **J101**. (Point C)
5. Apply +5 V DC power to the section between **J125** and **(+) foil side** of **C104**.
6. Connect the DC power supply as shown below.
   - +12 V terminal of the DC Power Supply connect to Point C.
   - GND terminal of the DC Power Supply connect to Point A.
   - –12 V terminal of the DC Power Supply connect to Point B.

To Check Signal

1. Input the audio signal and confirm in to be outputted from the terminal.

	INPUT	OUTPUT
L-ch	VCR-Lch terminal	VCR-Lch terminal
R-ch	VCR-Rch terminal	VCR-Rch terminal


DC Power Supply
ON
OFF
12V 15V 18V
12V 15V 18V
10V 0 10V DC +5V – 0 +
Short Point B
Short Point A
Short Point C
Short A
Short B
JK101-17 pin
JK101
J306
J307
J101
J126
J125
Short C
J305
J302
C104 +
0
DC Power Supply
D101
J125
+5V
J124
Short

■Schematic Diagram

Page
A FL CIRCUIT 12, 13
B IN/OUT TERMINAL CIRCUIT 13

- This schematic diagram may be modified at any time with the development of new technology.

Notes:

- **S301**: EQ SPACE on/off switch (EQ SPACE ON/FLAT)
- **S302**: Acoustic image EQ switch (ACOUSTIC IMAGE EQ)
- **S303**: EQ SPACE preset/manual select switch (PRESET/MANUAL)
- **S304**: Display mode select/demonstration switch (DISP MODE/–DEMO)
- **S305**: DOLBY PRO LOGIC on/off switch (DOLBY PRO LOGIC, OFF/ON) **[For (GC) area only]**
- **S306**: DOLBY PRO LOGIC mode select switch (MODE) **[For (GC) area only]**
- **S307**: DOLBY PRO LOGIC test signal switch (TEST) **[For (GC) area only]**
- **S308**: DOLBY PRO LOGIC center mode select switch (CENTER MODE) **[For (GC) area only]**
- **S310 ~ S313** : Multi control switch
  (MULTI CONTROL , S310 : ▼ , S311 : ◀ , S312 : ▲ , S313 : ▶)

- Indicated voltage values are the standard values for the unit measured by the DC electronic circuit tester (high-impedance) with the chassis taken as standard. Therefore, there may exist some errors in the voltage values, depending on the internal impedance of the DC circuit tester.

- Voltage values and waveforms are measured as indicated in the schematic diagram when test points between AG and VG, and between DG and CT-G , and between AG and DG are shorted.

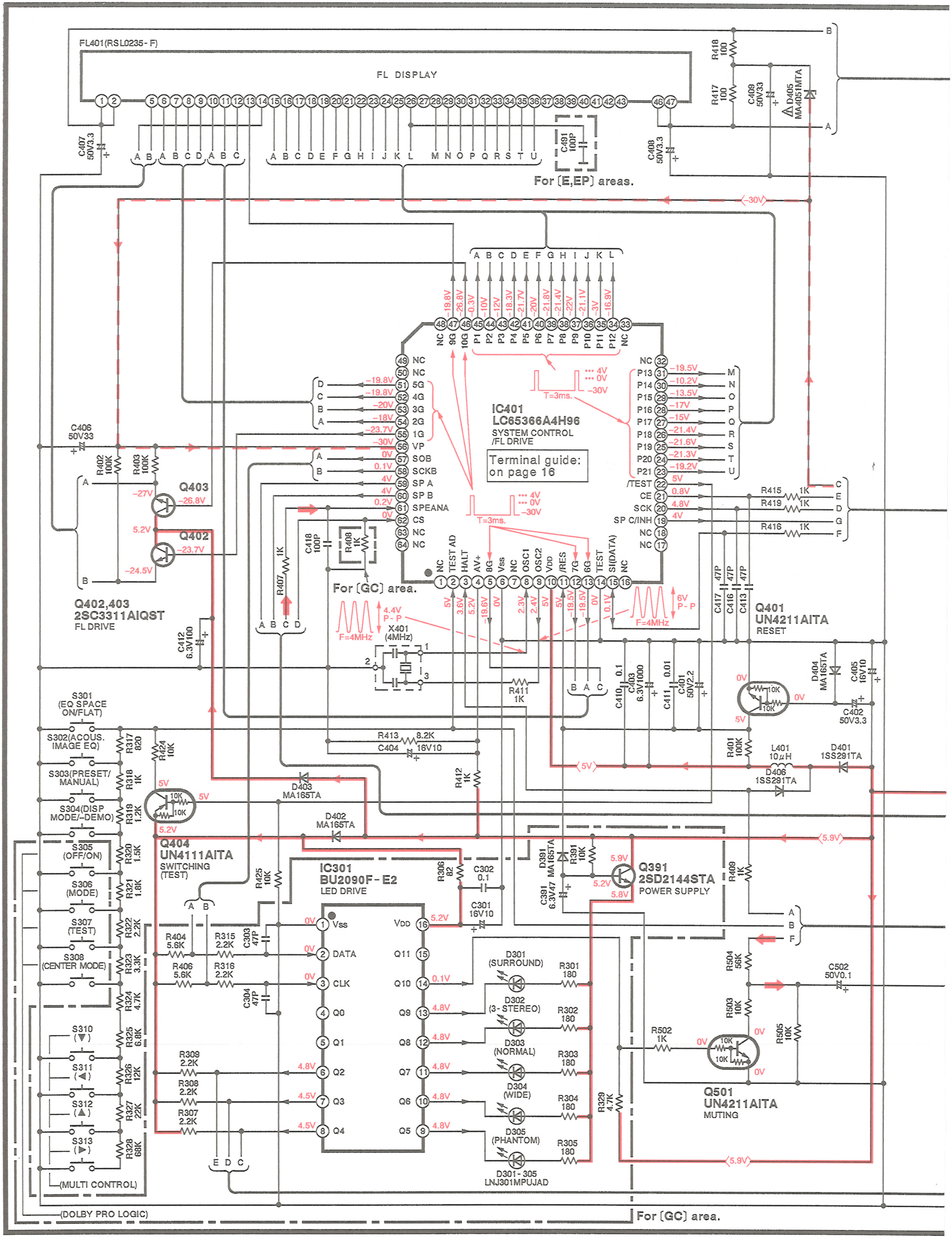
- Important safety notice:
  Components identified by ⚠ mark have special characteristics important for safety.
  Furthermore, special parts which have purposes of fire-retardant (resistors), high-quality sound (capacitors), low-noise (resistors), etc. are used. When replacing any of components, be sure to use only manufacturer's specified parts shown in the parts list.

- **Caution!**
  IC and LSI are sensitive to static electricity.
  Secondary trouble can be prevented by taking care during repair.
  Cover the parts boxes made of plastics with aluminum foil.
  Ground the soldering iron.
  Put a conductive mat on the work table.
  Do not touch the legs of IC or LSI with the fingers directly.

- **Voltage and signal line**

→ : Positive voltage line
⇢ : Negative voltage line
➡ : Spectrum analyzer signal line

A FL CIRCUIT (P.C.Board:on page 14)

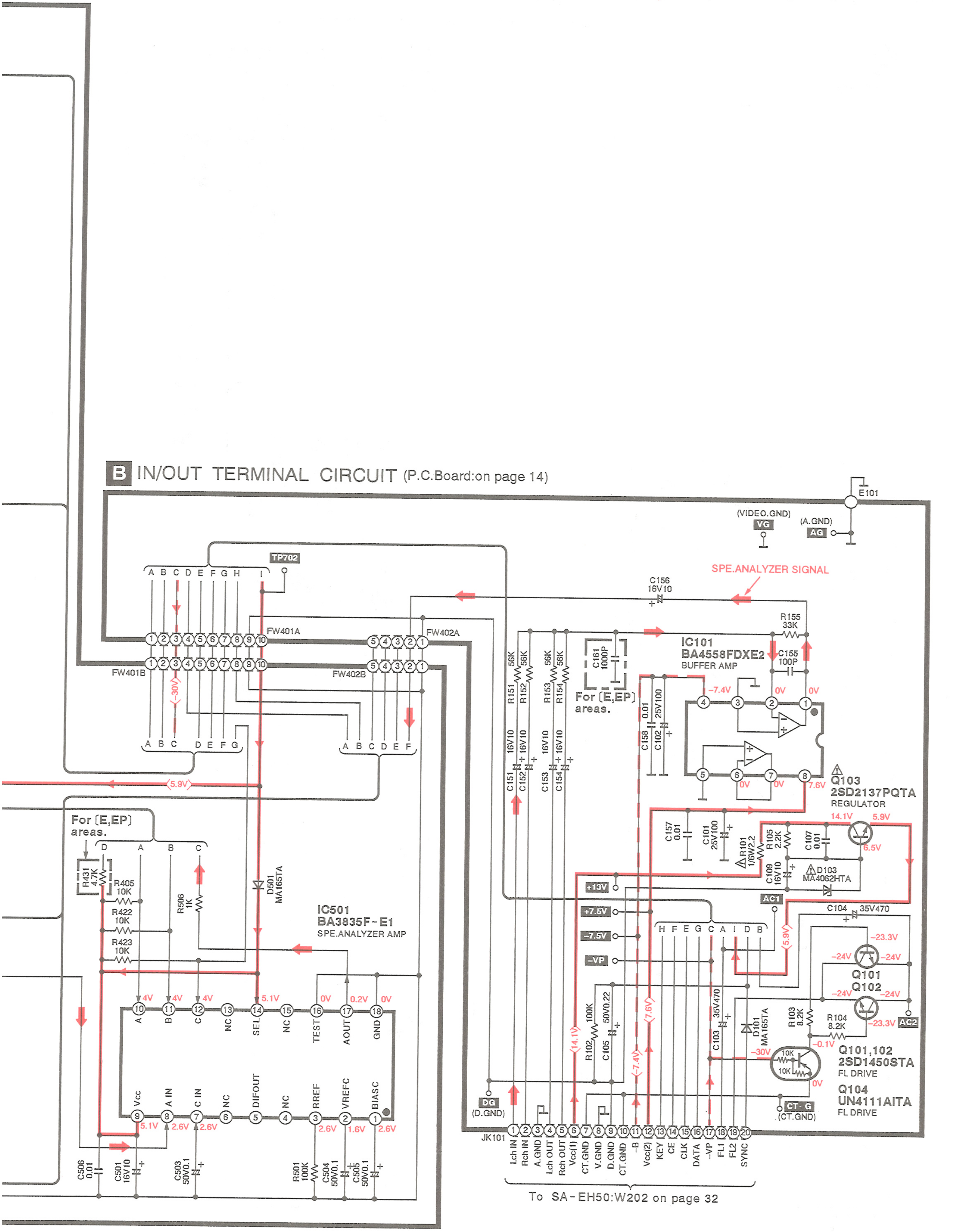

FL401(RSL0235-F)
FL DISPLAY
C407 50V3.3
C491 100P
For [E,EP] areas.
C408 50V3.3
R418 100
R417 100
C409 50V33
D405 MA4051MTA
(-30V)
IC401
LC65366A4H96
SYSTEM CONTROL
/FL DRIVE
Terminal guide: on page 16
T=3ms.
4V
0V
-30V
NC
9G
10G
P1
P2
P3
P4
P5
P6
P7
P8
P9
P10
P11
P12
5G
4G
3G
2G
1G
VP
SOB
SCKB
SP A
SP B
SPEANA
CS
P13
P14
P15
P16
P17
P18
P19
P20
P21
/TEST
CE
SCK
SP C/INH
TEST AD
HALT
AV+
8G
Vss
OSC1
OSC2
VDD
/RES
7G
6G
TEST
SI(DATA)
C406 50V33
R402 100K
R403 100K
Q403
Q402
Q402,403
2SC3311AIQST
FL DRIVE
-27V
-26.8V
5.2V
-23.7V
-24.5V
C412 6.3V100
R407 1K
C418 100P
R408 1K
For [GC] area.
4.4V P-P
F=4MHz
X401 (4MHz)
6V P-P
R411 1K
R415 1K
R419 1K
R416 1K
C417 47P
C416 47P
C413 47P
Q401
UN4211AITA
RESET
C410 0.1
C403 6.3V1000
C411 0.01
C401 50V2.2
D404 MA165TA
C405 16V10
C402 50V3.3
R401 100K
L401 10μH
D401 1SS291TA
D406 1SS291TA
(5V)
S301 (EQ SPACE ON/FLAT)
S302(ACOUS. IMAGE EQ)
S303(PRESET/ MANUAL)
S304(DISP MODE/-DEMO)
S305 (OFF/ON)
S306 (MODE)
S307 (TEST)
S308 (CENTER MODE)
S310 (▼)
S311 (◀)
S312 (▲)
S313 (▶)
(MULTI CONTROL)
(DOLBY PRO LOGIC)
R317 820
R318 1K
R319 1.2K
R320 1.5K
R321 1.8K
R322 2.2K
R323 3.3K
R324 4.7K
R325 6.8K
R326 12K
R327 22K
R328 68K
R424 10K
R413 8.2K
C404 16V10
D403 MA165TA
D402 MA165TA
R412 1K
Q404
UN4111AITA
SWITCHING
(TEST)
R425 10K
R404 5.6K
R406 5.6K
R315 2.2K
R316 2.2K
C303 47P
C304 47P
R309 2.2K
R308 2.2K
R307 2.2K
IC301
BU2090F-E2
LED DRIVE
Vss
DATA
CLK
Q0
Q1
Q2
Q3
Q4
VDD
Q11
Q10
Q9
Q8
Q7
Q6
Q5
R306 82
C302 0.1
C301 16V10
D391 MA165TA
R391 10K
C391 6.3V47
Q391
2SD2144STA
POWER SUPPLY
5.9V
5.8V
(5.9V)
R409 1K
D301 (SURROUND)
D302 (3-STEREO)
D303 (NORMAL)
D304 (WIDE)
D305 (PHANTOM)
D301-305
LNJ301MPUJAD
R301 180
R302 180
R303 180
R304 180
R305 180
R329 4.7K
R504 56K
R503 10K
R502 1K
R505 10K
C502 50V0.1
Q501
UN4211AITA
MUTING
For [GC] area.

→ : Positive voltage line

⇢ : Negative voltage line

➡ : Spectrum analyzer signal line

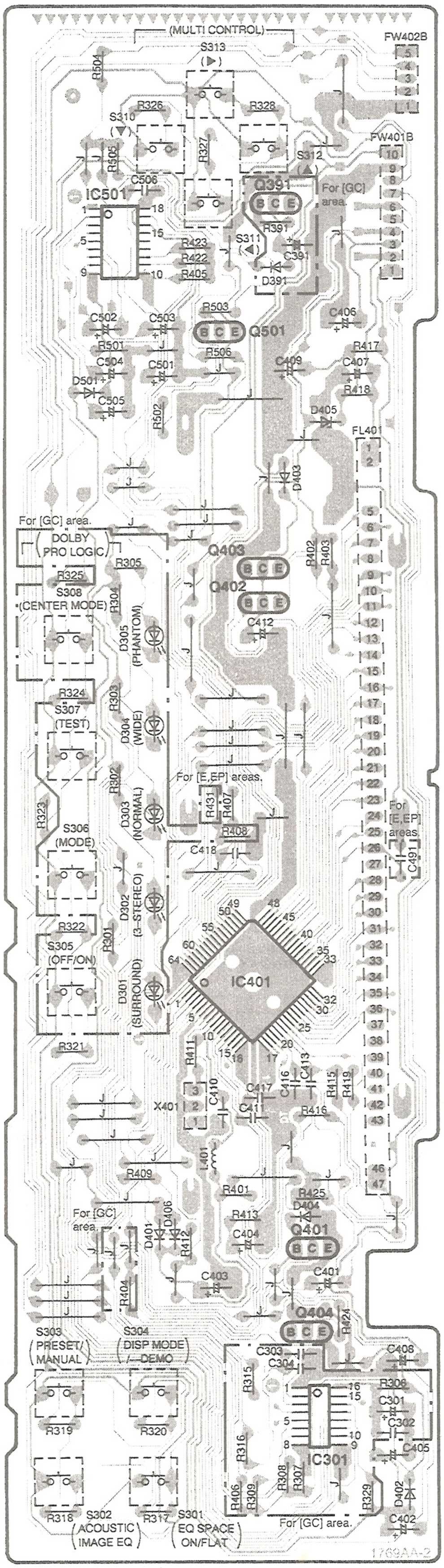
B IN/OUT TERMINAL CIRCUIT (P.C.Board:on page 14)


E101
(VIDEO.GND)
VG
(A.GND)
AG
SPE.ANALYZER SIGNAL
TP702
A B C D E F G H I
FW401A
FW401B
FW402A
FW402B
1 2 3 4 5 6 7 8 9 10
5 4 3 2 1
(-30V)
A B C D E F G
A B C D E F
(5.9V)
For [E,EP] areas.
D A B C
R431 4.7K
R405 10K
R422 10K
R423 10K
R506 1K
D501 MA165TA
IC501
BA3835F-E1
SPE.ANALYZER AMP
4V 4V 4V 5.1V 0V 0.2V 0V
10 A
11 B
12 C
13 NC
14 SEL
15 NC
16 TEST
17 AOUT
18 GND
9 Vcc
8 A IN
7 C IN
6 NC
5 DIFOUT
4 NC
3 RREF
2 VREFC
1 BIASC
5.1V 2.6V 2.6V 2.6V 1.6V 2.6V
C506 0.01
C501 16V10
C503 50V0.1
R501 100K
C504 50V0.1
C505 50V0.1
C156 16V10
R155 33K
IC101
BA4558FDXE2
BUFFER AMP
C155 100P
C161 1000P
For [E,EP] areas.
R151 56K
R152 56K
R153 56K
R154 56K
C151 16V10
C152 16V10
C153 16V10
C154 16V10
C158 0.01
C102 25V100
-7.4V 0V 0V
4 3 2 1
5 6 7 8
0V 0V 7.6V
Q103
2SD2137PQTA
REGULATOR
14.1V 5.9V 6.5V
C157 0.01
C101 25V100
R101 1/6W2.2
R105 2.2K
C107 0.01
C109 16V10
D103 MA4062HTA
+13V
+7.5V
-7.5V
-VP
AC1
C104 35V470
H F E G C A I D B
(5.9V)
-23.3V
-24V -24V
Q101
Q102
-24V -24V
-23.3V
AC2
R103 8.2K
R104 8.2K
-0.1V
Q101,102
2SD1450STA
FL DRIVE
Q104
UN4111AITA
FL DRIVE
10K 10K
0V
-30V
D101 MA165TA
C103 35V470
R102 100K
C105 50V0.22
(14.1V)
(-7.4V)
(7.6V)
DG
(D.GND)
CT・G
(CT.GND)
JK101
1 Lch IN
2 Rch IN
3 A.GND
4 Lch OUT
5 Rch OUT
6 Vcc(1)
7 CT.GND
8 V.GND
9 D.GND
10 CT.GND
11 -B
12 Vcc(2)
13 KEY
14 CE
15 CLK
16 DATA
17 -VP
18 FL1
19 FL2
20 SYNC
To SA-EH50:W202 on page 32

■ Printed Circuit Board Diagram

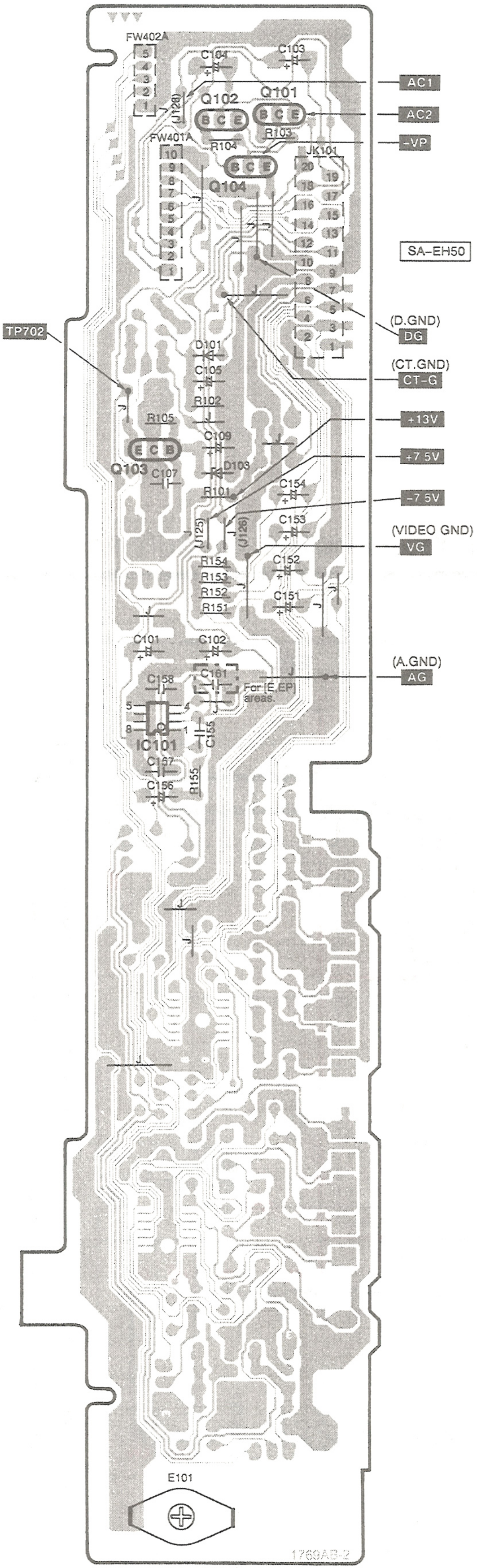
- This circuit board diagram may be modified at any time with the development of new technology.

A FL P.C.B.


(MULTI CONTROL)
S313
(▶)
FW402B
R504
S310
(◀)
R326
R328
R327
S312
(▲)
FW401B
R505
C506
IC501
Q391
For [GC] area.
R391
S311
(▲)
R423
R422
R405
C391
D391
C502
C503
R503
Q501
C406
R501
R417
C504
C501
R506
C409
C407
D501
C505
R418
R502
D405
FL401
D403
For [GC] area.
DOLBY PRO LOGIC
R305
Q403
R402
R403
R325
S308
(CENTER MODE)
R304
Q402
D305 (PHANTOM)
C412
R324
S307
(TEST)
R303
D304 (WIDE)
R302
For [E,EP] areas.
R431
R407
R323
S306
(MODE)
D303 (NORMAL)
R408
For [E,EP] areas
C418
C491
D302 (3-STEREO)
R322
S305
(OFF/ON)
R301
IC401
D301 (SURROUND)
R321
R411
C410
C417
C416
C413
R415
R419
X401
C41
R416
L401
R409
R401
R425
D404
For [GC] area.
R413
D406
D401
R412
C404
Q401
C403
C401
R404
Q404
R424
S303
(PRESET/MANUAL)
S304
(DISP MODE/DEMO)
C303
C304
C408
R315
R306
C301
C302
R319
R320
C405
R316
IC301
R308
R307
R406
R309
R329
D402
R318
S302
(ACOUSTIC IMAGE EQ)
R317
S301
(EQ SPACE ON/FLAT)
For [GC] area.
C402
1769AA-2

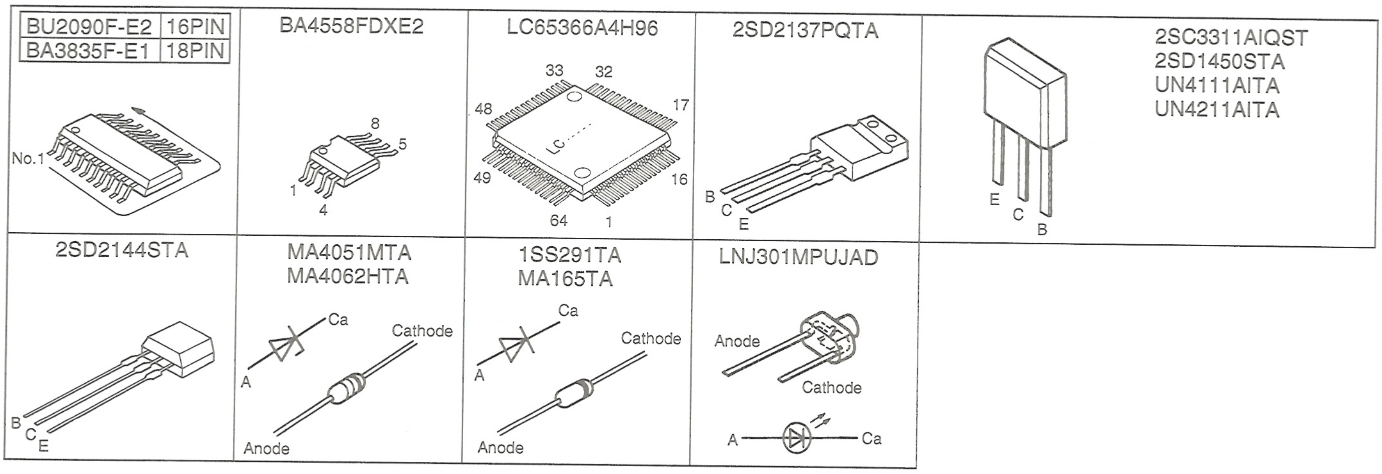
(REP2474D-M...[GC]
REP2474E-M...[E,EP])

B IN/OUT TERMINAL P.C.B.

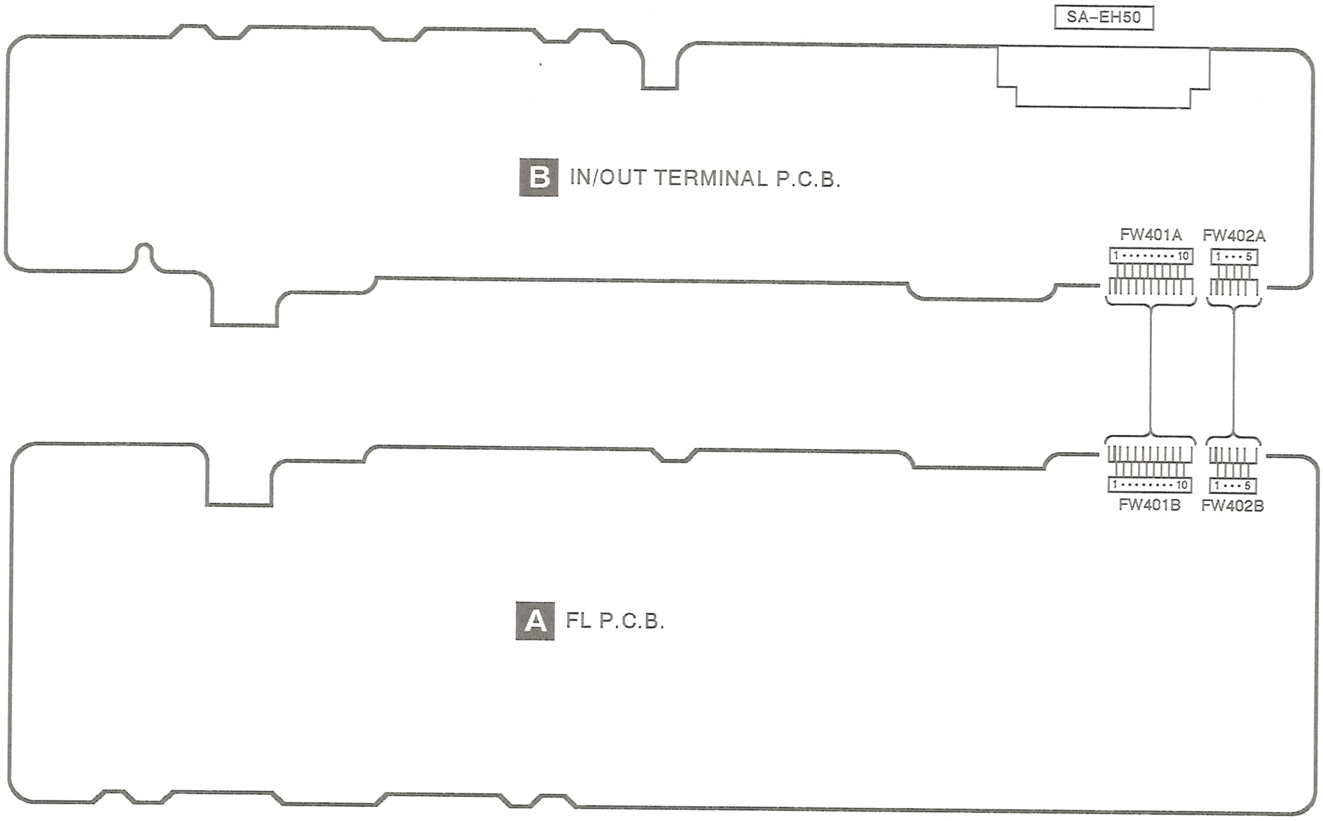

FW402A
C104
C103
AC1
(J128)
Q102
Q101
AC2
R103
-VP
FW401A
R104
JK101
Q104
SA-EH50
(D.GND)
DG
TP702
D101
C105
(CT.GND)
CT-G
R102
R105
C109
+13V
Q103
C107
D103
+7.5V
R101
C154
-7.5V
(J125)
(J126)
C153
(VIDEO GND)
VG
R154
C152
R153
R152
C151
R151
C101
C102
(A.GND)
AG
C158
C161
For [E,EP] areas.
IC101
C155
C157
C156
R155
E101
1769AB-2

(REP2474D-M...[GC]
REP2474E-M...[E,EP])

Type Illustration of IC's, Transistors and Diodes


BU2090F-E2 16PIN
BA3835F-E1 18PIN
No.1
BA4558FDXE2
8
5
1
4
LC65366A4H96
33
32
48
17
49
16
64
1
2SD2137PQTA
B
C
E
2SC3311AIQST
2SD1450STA
UN4111AITA
UN4211AITA
E
C
B
2SD2144STA
B
C
E
MA4051MTA
MA4062HTA
Ca
A
Cathode
Anode
1SS291TA
MA165TA
Ca
A
Cathode
Anode
LNJ301MPUJAD
Anode
Cathode
A
Ca

Wiring Connection Diagram

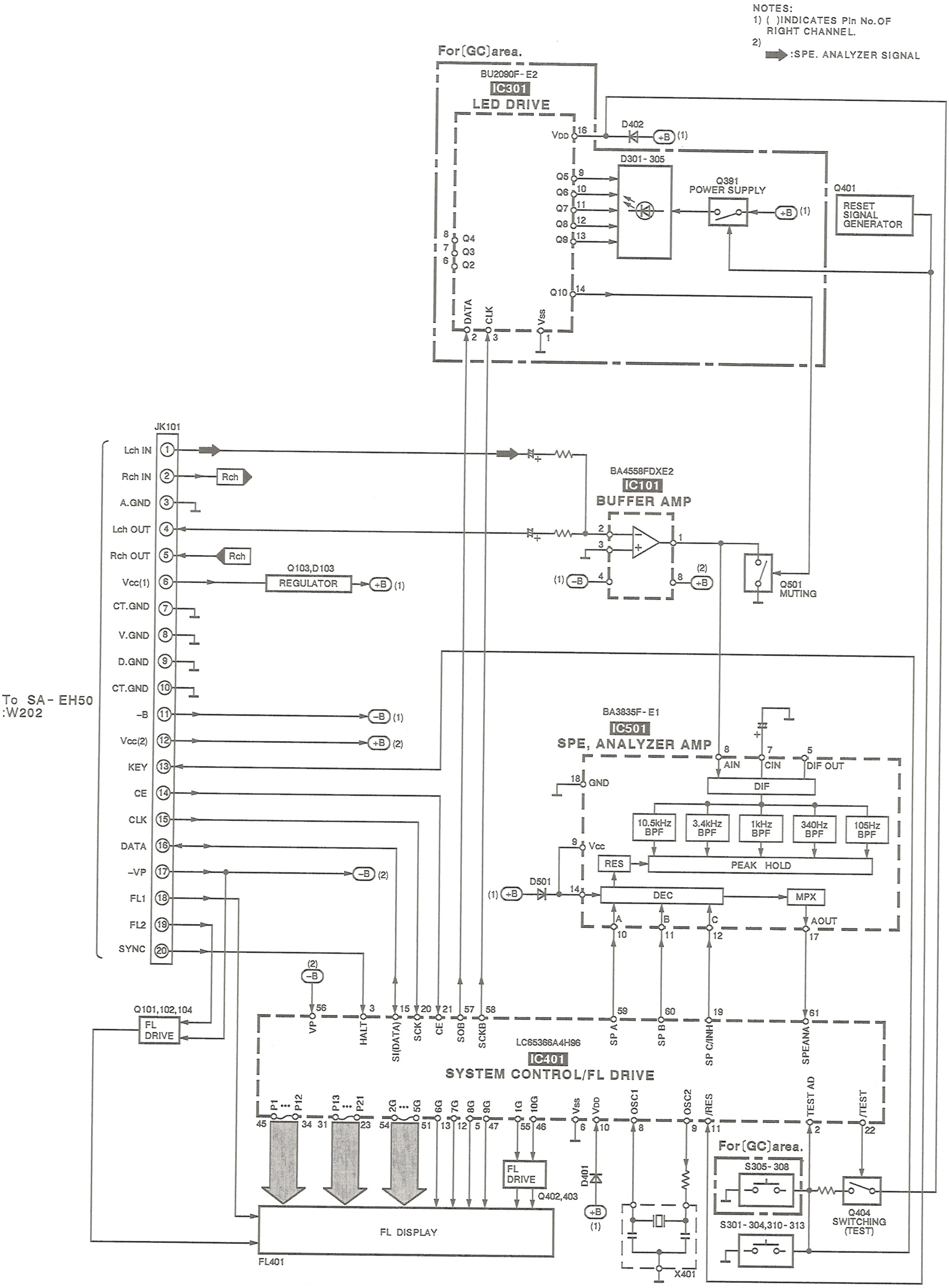

SA-EH50
B IN/OUT TERMINAL P.C.B.
FW401A
FW402A
1 10
1 5
1 10
1 5
FW401B
FW402B
A FL P.C.B.

■ Terminal Function of IC's

● IC401 (LC65366A4H96)

Pin No.	Terminal Name	I/O	Function
1	NC	—	No used, open
2	TEST AD	I	TEST mode key signal input
3	HALT	I	Power failure detect signal input
4	AV+	—	Power supply for analog circuit (+5 V)
5	8G	O	Grid signal output
6	VSS	—	GND terminal
7	NC	—	No used, open
8	OSC1	I	Oscillator connected terminal (4 MHz)
9	OSC2	O	
10	VDD	—	Power supply
11	/RES	I	Reset signal input
12, 13	7G, 6G	O	Grid signal output
14	TEST	—	No used, open
15	SI	I/O	Communication data signal input from SA-EH60
16~18	NC	—	No used, open
19	SP C/INH	O	Select terminal for Spectrum analyzer IC output
20	SCK	O	Serial communication signal from SA-EH60 (Clock signal input)
21	CE	O	Serial communication signal from SA-EH60 (Chip enable signal input)
22	/TEST	O	Test signal terminal
23~31	P21~P13	O	Segment signal output
32, 33	NC	—	No used, open
34~45	P12~P1	O	Segment signal output
46, 47	10G, 9G	O	Grid signal output
48~50	NC	—	No used, open
51~55	5G~1G	O	Grid signal output
56	VP	—	Negative power supply
57	SOB	O	Serial data signal output
58	SCKB	O	Serial clock signal output
59	SP A	O	Select terminal for Spectrum analyzer IC output
60	SP B	O	
61	SPEANA	I	Analog signal input for spectrum analyzer IC
62	CS	I	Chip select signal input terminal
63, 64	NC	—	No used, open

■ Block Diagram



NOTES:
1) ( )INDICATES Pin No.OF RIGHT CHANNEL.
2) ➡ :SPE. ANALYZER SIGNAL

For〔GC〕area.
BU2090F-E2
IC301
LED DRIVE
VDD 16
D402
+B (1)
D301-305
Q5 9
Q6 10
Q7 11
Q8 12
Q9 13
8 Q4
7 Q3
6 Q2
Q391
POWER SUPPLY
+B (1)
Q401
RESET SIGNAL GENERATOR
Q10 14
DATA 2
CLK 3
Vss 1
JK101
Lch IN 1
Rch IN 2
Rch
A.GND 3
Lch OUT 4
Rch OUT 5
Rch
Vcc(1) 6
Q103,D103
REGULATOR
+B (1)
CT.GND 7
V.GND 8
D.GND 9
CT.GND 10
-B 11
-B (1)
Vcc(2) 12
+B (2)
KEY 13
CE 14
CLK 15
DATA 16
-VP 17
-B (2)
FL1 18
FL2 19
SYNC 20
To SA-EH50 :W202
BA4558FDXE2
IC101
BUFFER AMP
2
3
1
(1) -B 4
8 (2) +B
Q501
MUTING
BA3835F-E1
IC501
SPE, ANALYZER AMP
8 AIN
7 CIN
5 DIF OUT
18 GND
DIF
10.5kHz BPF
3.4kHz BPF
1kHz BPF
340Hz BPF
105Hz BPF
9 Vcc
RES
PEAK HOLD
D501
(1) +B
14
DEC
MPX
A 10
B 11
C 12
AOUT 17
(2) -B
Q101,102,104
FL DRIVE
56 VP
3 HALT
15 SI(DATA)
20 SCK
21 CE
57 SOB
58 SCKB
59 SP A
60 SP B
19 SP C/INH
61 SPEANA
LC65366A4H96
IC401
SYSTEM CONTROL/FL DRIVE
45 P1 ... P12 34
31 P13 ... P21 23
54 2G ... 5G 51
6G 13
7G 12
8G 5
9G 47
1G 55
10G 46
Vss 6
VDD 10
OSC1 8
OSC2 9
/RES 11
TEST AD 2
/TEST 22
FL DRIVE
Q402,403
D401
+B (1)
X401
FL DISPLAY
FL401
For〔GC〕area.
S305-308
S301-304,310-313
Q404
SWITCHING (TEST)

■ Replacement Parts List (Electrical and Cabinet)

Notes: *Important safety notice:
Components identified by ⚠ mark have special characteristics important for safety.
Furthermore, special parts which have purposes of fire-retardant (resistors), high-quality sound (capacitors), low-noise (resistors), etc. are used.
When replacing any of components, be sure to use only manufacture's specified parts shown in the parts list.
*The parenthesized indications in the Remarks columns specify the areas. (Refer to the cover page for area.)
Parts without these indications can be used for all areas.
*[M] Indicates in Remarks columns parts that are supplied by MESA.
*The "(SF)" mark denotes the standard part.

Ref. No.	Part No.	Part Name & Description	Remarks
		INTEGRATED CIRCUIT(S)	
IC101	BA4558FDXE2	IC	[M]
IC401	LC65366A4H96	IC	[M]
IC301	BU2090F-E2	IC	[M] (GC)
IC501	BA3835F-E1	IC	[M]
		TRANSISTOR(S)	
Q101, 102	2SD1450RTA	TRANSISTOR	[M]
Q103⚠	2SD2137PQTA	TRANSISTOR	[M]
Q104	UN4111	TRANSISTOR	[M]
Q391	2SD2144STA	TRANSISTOR	[M] (GC)
Q401	UN4211	TRANSISTOR	[M]
Q402, 403	2SC3311AIRTA	TRANSISTOR	[M]
Q404	UN4111	TRANSISTOR	[M]
Q501	UN4211	TRANSISTOR	[M]
		DIODE(S)	
D101	MA165	DIODE	[M]
D103⚠	MA4062-H	DIODE	[M]
D301-305	LNJ301MPUJAD	L. E. D.	[M] (GC)
D391	MA165TA	DIODE	[M] (GC)
D401	1SS291TA	DIODE	[M]
D402-404	MA165	DIODE	[M]
D405⚠	MA4051MTA	DIODE	[M]
D406	1SS291TA	DIODE	[M]
D501	MA165	DIODE	[M]
		COIL(S)	
L401	RLQA100JT-Y	COIL	[M]
		OSCILLATOR(S)	
X401	EF0EC4004T4	OSCILLATOR	[M]
		DISPLAY TUBE	
FL401	RSL0235-F	DISPLAY TUBE	[M]
		SWITCH(ES)	
S301-304	EVQ21405R	SW	[M]
S305-308	EVQ21405R	SW	[M] (GC)
S310-313	EVQ21405R	SW	[M]
		EARTH TERMINAL(S)	
E101	SNE1004-2	EARTH TERMINAL	[M]
		JACK(S)	
JK101	RJT065K20	SYSTEM	[M]

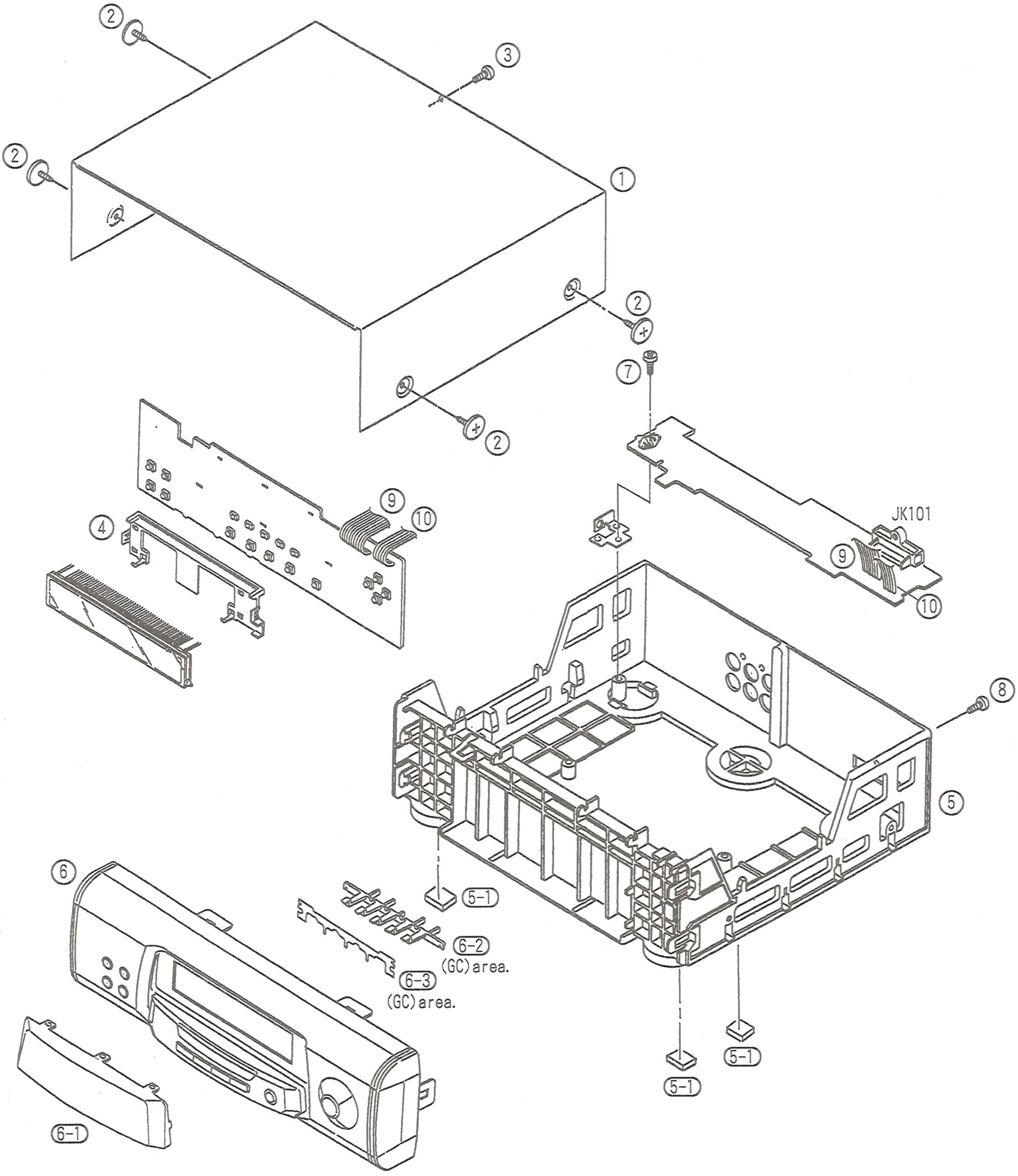
Ref. No.	Part No.	Part Name & Description	Remarks
		CABINET PARTS	
1	RKM0302-K	CABINET	[M]
2	RHD30007-K1	SCREW	[M]
3	XTB3+8JFZ	SCREW	[M]
4	RMN0424	FL HOLDER	[M]
5	RYK0700C-K	BOTTOM CABINET ASS'Y	[M] (E, EP)
5	RYK0700F-K	BOTTOM CABINET ASS'Y	[M] (GC)
5-1	SHG1654	RUBBER	[M]
6	RYP0733B-K	FRONT PANEL ASS'Y	[M] (E, EP)
6	RYP0733C-K	FRONT PANEL ASS'Y	[M] (GC)
6-1	RKW0504-V	FL PANEL	[M]
6-2	RGL0358-Q	LENS	[M] (GC)
6-3	RMZ0423	SHEET	[M] (GC)
7	XTBS3+8JFZ1	SCREW	[M]
8	XTB3+8JFZ	SCREW	[M]
9	RWJ5710240KK	FLAT CABLE (FW401/10P)	[M]
10	RWJ5705240KK	FLAT CABLE (FW402/5P)	[M]

Resistors and Capacitors

Notes : * Capacity values are in microfarads (uF) unless specified otherwise, P=Pico-farads (pF) F=Farads (F)
* Resistance values are in ohms, unless specified otherwise, 1K=1,000 (OHM) , 1M=1,000k (OHM)

Ref. No.	Part No.	Values & Remarks
		RESISTORS
R101⚠	ERQ16NKW2R2E	1/6W 2.2 [M]
R102	ERDS2TJ104	1/4W 100K [M]
R103, 104	ERDS2TJ822	1/4W 8.2K [M]
R105	ERDS2TJ222	1/4W 2.2K [M]
R151-154	ERDS2TJ563	1/4W 56K [M]
R155	ERDS2TJ333	1/4W 33K [M]
R301-305	ERDS2TJ181T	1/4W 180 [M] (GC)
R306	ERDS2TJ820T	1/4W 82 [M] (GC)
R307-309	ERDS2TJ222T	1/4W 2.2K [M] (GC)
R315, 316	ERDS2TJ222T	1/4W 2.2K [M] (GC)
R317	ERDS2TJ821	1/4W 820 [M]
R318	ERDS2TJ102	1/4W 1K [M]
R319	ERDS2TJ122	1/4W 1.2K [M]
R320	ERDS2TJ152	1/4W 1.5K [M]
R321	ERDS2TJ182	1/4W 1.8K [M]
R322	ERDS2TJ222	1/4W 2.2K [M]
R323	ERDS2TJ332	1/4W 3.3K [M]
R324	ERDS2TJ472	1/4W 4.7K [M]
R325	ERDS2TJ682T	1/4W 6.8K [M]
R326	ERDS2TJ123	1/4W 12K [M]
R327	ERDS2TJ223	1/4W 22K [M]
R328	ERDS2TJ683	1/4W 68K [M]
R329	ERDS2TJ472T	1/4W 4.7K [M] (GC)
R391	ERDS2TJ103T	1/4W 10K [M] (GC)
R401-403	ERDS2TJ104	1/4W 100K [M]
R404	ERDS2TJ562T	1/4W 5.6K [M] (GC)
R405	ERDS2TJ103	1/4W 10K [M]
R406	ERDS2TJ562T	1/4W 5.6K [M] (GC)
R407	ERDS2TJ102	1/4W 1K [M]
R408	ERDS2TJ102T	1/4W 1K [M] (GC)
R409	ERDS2TJ102	1/4W 1K [M]
R411, 412	ERDS2TJ102	1/4W 1K [M]
R413	ERDS2TJ822	1/4W 8.2K [M]
R415, 416	ERDS2TJ102	1/4W 1K [M]
R417, 418	ERDS2TJ101	1/4W 100 [M]
R419	ERDS2TJ102	1/4W 1K [M]
R422-425	ERDS2TJ103	1/4W 10K [M]
R431	ERDS2TJ472	1/4W 4.7K [M] (E, EP)
R501	ERDS2TJ104	1/4W 100K [M]
R502	ERDS2TJ102	1/4W 1K [M]
R503	ERDS2TJ103	1/4W 10K [M]
R504	ERDS2TJ563	1/4W 56K [M]
R505	ERDS2TJ103	1/4W 10K [M]
R506	ERDS2TJ102	1/4W 1K [M]
		CAPACITORS
C101, 102	ECA1EM101B	25V 100U [M]
C103, 104	RCE1VM471BV	35V 470U [M]
C105	ECEA1HKAR22B	50V 0.22U [M]
C107	ECBT1E103ZF	25V 0.01U [M]
C109	RCE1CKA100BG	16V 10U [M]
C151-154	RCE1CKA100BG	16V 10U [M]
C155	ECBT1H101KB5	50V 100P [M]
C156	RCE1CKA100BG	16V 10U [M]
C157, 158	ECBT1E103ZF	25V 0.01U [M]
C161	ECBT1H102KB5	50V 1000P [M] (E, EP)
C301	RCE1CKA100BG	16V 10U [M] (GC)
C302	ECBT1H104ZF5	50V 0.1U [M] (GC)
C303	ECBT1H470J5	50V 47P [M] (GC)
C304	ECBT1H470J5	50V 47P [M] (GC)
C391	RCE0JKA470BG	6.3V 47U [M] (GC)
C401	ECEA1HKA2R2B	50V 2.2U [M]
C402	RCE1HKA3R3BG	50V 3.3U [M]
C403	RCE0JU102BV	6.3V 1000U [M]
C404, 405	RCE1CKA100BG	16V 10U [M]
C406	ECEA1HKA330B	50V 33U [M]
C407, 408	RCE1HKA3R3BG	50V 3.3U [M]
C409	ECEA1HKA330B	50V 33U [M]
C410	ECBT1H104ZF5	50V 0.1U [M]
C411	ECBT1E103ZF	25V 0.01U [M]
C412	ECEA0JKS101B	6.3V 100U [M]
C413	ECBT1H470J5	50V 47P [M]
C416, 417	ECBT1H470J5	50V 47P [M]
C418	ECBT1H101KB5	50V 100P [M]
C491	ECBT1H101KB5	50V 100P [M] (E, EP)
C501	RCE1CKA100BG	16V 10U [M]
C502-505	ECEA1HKA0R1B	50V 0.1U [M]
C506	ECBT1E103ZF	25V 0.01U [M]

■ Cabinet Parts Location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